period has arrived when European pheasants, grouse, and plover are rapidly replacing corresponding American birds; and unless suitable measures be adopted for preserving and increasing our own game, we shall doubtless have to depend more and more on imported game for our market supply."

The present scarcity of game is compared with its former abundance, and the cause of the decrease is traced to the recklessness of the early colonists and their pioneer successors in the settlement of the country, to the conversion of wild into cultivated land, and to unrestricted trade in game, aided by modern cheap rapid transit and cold storage. The present prices of game here and in Europe are compared, and also the cost in this country of European grouse, plover, etc. in comparison with the far greater cost of American game of similar character. "The principal reason for this apparent anomaly is," it is stated, "that the European game markets are largely supplied by private preserves, which are comparatively few in number and near the market, and which can maintain their stock at a fairly constant point; while the American supply is obtained from distant and numerous sources and is derived from wild and practically unregulated stock .... Free marketing of wild game leads swiftly to extermination, while game reared as private property may be marketed freely without reducing stock."— J. A. A.

Cooke on Migration Routes of North American Birds.[1] — Prof. Cooke states: "The Bureau of Biologic Survey of the United States Department of Agriculture has collected much information on the migration of North American birds, and this article is an attempt to put in popular form some of the data that have already appeared in the more technical bulletins and reports."

A number of outline maps effectively illustrate the text. The seven principal migration routes used by North American birds in their migrations to and from South America are thus graphically shown. We are warned against supposing that "these routes as outlined on the map represent distinctly segregated pathways. On the contrary, they are merely convenient subdivisions of the one great flightway which extends from North to South America. There is probably no single mile in the whole line between northern Mexico and the Lesser Antilles which is not crossed each fall by migrating birds." The great bulk of the land birds, both as to species and individuals, cross the Gulf to eastern Mexico, while two less important routes run from Florida through the West Indies to South America. The species of the western United States whose migrations are, on the whole, much less extensive, follow two main routes to their winter homes in Mexico.

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[1] Our Greatest Travelers: Birds that fly from Pole to Pole and Shun Darkness: Birds that make 2,500 Miles in a Single Flight. By Wells W. Cooke, of the Biological Survey, U. S. Department of Agriculture. National Geographic Magazine, April, 1911, pp. 346–365, 6 maps.

Nine interesting species are taken up in detail and their migration routes described and plotted. The extremes of direct and circuitous routes are exemplified by the Black-poll Warbler and the Cliff Swallow respectively. The two races of the Palm Warbler travel by wholly different routes to and from their winter homes. (The author, however, omits to state for the benefit of the general reader, that the Palm Warblers belong to two quite distinct subspecies). The migration line of the Eastern form is from northeast to southwest, while that of the Western race runs from northwest to southeast, the two lines crossing at right angles in Georgia.

The Connecticut Warbler on its southward flight in the fall follows a wholly different path from that by which it reached its breeding grounds in the spring. An elliptical route such as this is rare among land birds but is followed on a far larger scale by a number of water birds of which the Golden Plover is here taken as an example.

The greatest traveler of all is the Arctic Tern, which breeds in the Arctic regions and winters in the Antarctic, and in its annual wanderings between these two points must cover over 22,000 miles. The northward migration of the Robin is of interest as it keeps pace with the advance of spring, and the Robins of the Pacific side of the continent travel at a much more rapid rate than those of the Atlantic slope and the interior. A very narrow path from the United States to South America is followed by the Scarlet Tanager; while the Bobolink deserves special mention as it is extending its range towards the Pacific coast, thereby lengthening its route of migration.

Prof. Cooke also endeavors to trace the evolution of the present remarkable migration lines of the Golden Plover and maps the hypothetical routes of earlier times.— W. DeW. M.

Beal on the Food of Woodpeckers.[1] — This paper gives the results of the stomach examination of 3500 woodpeckers, representing 22 species. The number of individuals of each kind examined ranges from one of the Gila Woodpecker and two of the Ivory-bill to 684 of the Flicker and 723 of the Downy Woodpecker.

The Red-headed, Hairy and Red-bellied Woodpeckers and the Yellow-bellied Sapsucker are each represented by more than 270 specimens. As the individuals of these six species were taken throughout the United States range of each, representing many subspecies, and in every month of the year, the material is ample on which to base conclusions as to their economic value. With most of the remaining species, while the results are less conclusive, at least the general character of their food is well shown.

In the genera of the *Melanerpes* group the percentage of vegetable food exceeds that of animal, in *Picoides* and *Dryobates* the animal food greatly

[1] Food of Woodpeckers of the United States. By F. E. L. Beal, Assistant, Biological Survey. Biological Survey Bull. No. 37. 8vo, pp. 64, with 6 colored plates and 3 text cuts. May 24, 1911.